



Adobe Creek Project - United Anglers of Casa Grande High School

“Together we Stand. Together we Dream. Together we will Change the World”

The Problem:

With the ever growing environmental and energy problems facing our nation, it is becoming clear that we must equip our children with the knowledge and resources necessary to overcome these problems. Even the directives of creating “green” buildings and “green” jobs will rely on a future workforce that understands the environment!

Our Solution:

Through 1) hands-on environmental restoration, 2) community stewardship, and 3) the application of scientific method, we seek to empower our students to become leaders in their communities and sponsors of environmental programs that promote wise conservation strategies and contribute to a healthier world we all share.

Our program:

In continuous operations since 1983, we have

1. Restored a formerly dead stream, Adobe Creek, to its native riparian habitat
2. Removed stream-bed obstructions and planted vegetation to allow native salmon to return to spawn
3. Built a hatchery and classroom facility on the campus of Casa Grande High School in Petaluma, CA to hatch and nurture 50,000 fry to smolt to be released each year into San Francisco Bay through local community-sponsored outreach programs

Our current needs: (that will be satisfied by this grant program of \$1.5 million) include:

A) Build an extension to our classroom to accommodate:

1. Laboratory space for R&D to meet requirements of the MAD FISH DNA analysis program required by the Pacific Salmon Commission
2. Alternate energy including solar to assist powering the facility.
3. An outreach multi-media center for distance teaching.

B) Provide program support funding to sustain the teaching program for five years.

Expected end results from the grant:

1. Comply with government regulations for hatchery fish entering the Pacific Salmon Treaty
2. Extend our classroom teaching to other schools around the state of California and the U.S.
3. Incorporate a renewable energy program into our sustainability teaching program

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Summary

Since its inaugural year in 1983, each year the United Anglers of Casa Grande High School (UACG) accepts 20 applicants from a pool of 200 high school students. In addition, the Junior United Angler Program involves both third and fifth grade classes from four local elementary schools and includes over 300 children. The longevity of this program is impressive, and some UACG alumni involved in starting the group now have children in the Junior UACG. For many of the hundreds of students that have been involved in the restoration of Adobe Creek and the rehabilitation of its sensitive species, the UACG project has become a lifeline to last a lifetime.

Our vision

The vision of UACG is to empower our students through the efforts of hands-on environmental restoration, community stewardship and the application of scientific method to wise environmental conservation. Since 1983, every school year commences with the graduation of UACG seniors. Filled with pride and a hope for the future, they pass the torch to incoming freshmen, who are charged with the responsibility of keeping the dream alive!

Our Mission and Core Activities (Objectives)

- **Objective #1 (ECOLOGY)** focuses on the continued restoration efforts of UACG in local Adobe Creek. Not only will the students continue to monitor and repair the Adobe Creek habitat, but their efforts will be expanded to include Lynch Creek, Washington Creek and the Petaluma River.
- **Objective #2 (STEWARDSHIP)** of UACG has always been to empower high school students with the tools and resources necessary to rescue a population of fish in local Adobe Creek while instilling in them the need for community and environmental stewardship. Simply, UACG teaches children to care and challenges them to make a difference.
- **Objective #3 (SCIENCE)** is to develop a program that integrates didactic classroom curriculum with hands-on scientific method and fieldwork. With emerging technology, conservation and environmental policy is increasingly being made at the molecular level. DNA-based analysis and coded wire tagging (CWT) will be used to bridge the gap between the diverse scientific disciplines of conservation biology and molecular biology. We are hopeful this experience will illuminate career paths the students did not know existed!
- **Objective #4 (OUTREACH)** challenges the students of UACG to become educators and mentors themselves. It is important for the students to understand that the sustainability of their efforts depends upon public education.

Organization

- Located in Petaluma, CA UACG began in 1983 as a grassroots effort to save a local creek. Once a major source of drinking water for the Petaluma Valley in the 1800s, Adobe Creek's seven-mile course was diverted and polluted. It was declared unviable by state officials and there were plans to channelize the creek and divert it underground.
- Two decades, hundreds of students, and one fish hatchery later, Adobe Creek now supports the annual return of both Steelhead and Chinook Salmon runs, species that were thought to be doomed in the area!
- The project has since expanded, and through its Junior Angler program with local third and fifth grade classrooms now inspires hundreds of high school and elementary students to believe in themselves and feel connected to their environment.

- Alumni of UACG now populate positions with State and Federal conservation agencies, proving that children who care and believe in themselves can become the environmental policymakers of our future!

Management

Board of Directors- Chosen by the director of the program, Tom Furrer, to be active participants in the execution of our vision and maintain our Not-For-Profit status.

Corporate Formation

UACG was founded and is maintained by Casa Grande High School teacher Thomas Furrer, who has 28 years of teaching experience at Casa Grande High School. His passion and commitment to teaching his students about the environment and the future challenges faced within lead to his vision of UACG. This vision, shared by the hundreds of students that have walked through the doorway of the fish hatchery, is what sustains the program to this day.

Future of UACG (based upon where we've come from)

In 1991, after just eight years of restoration by UACG high school students, the City of Petaluma was pressed into removing all water diversions on Adobe Creek. For the first time in over a century, the entire seven miles of Adobe Creek flowed with water! Additionally, students have planted over 1,100 trees per annum to provide shade and oxygenation for a healthy riparian habitat. To date, over 30 tons of debris have been removed from the creek. The students also recruited the help of the National Oceanic and Atmospheric Administration (NOAA) in constructing a permanent step-pool fish ladder system. Completion of this ladder provides safe passage for steelhead and Chinook over a 12-foot obstruction for access to additional spawning habitat, thus removing the last barrier to give the student's fish a chance!

In an effort to protect the very fish the students fought so hard to save, UACG set out to build a fisheries research facility and fish hatchery on the high school campus. The site was to serve as a "state of the art" education facility to both study the genetic structure of the subpopulations of fish returning to Adobe Creek to spawn and to provide a hatchery-based supportive breeding program for these native runs of fish. The facility was completed with over \$510,000.00 raised by the students through community philanthropy and continues to raise nearly 50,000 fish per annum.

The successful rehabilitation of Adobe Creek and subsequent success of the student's hatchery-based supportive breeding program charged the kids with the responsibility of characterizing and managing the release of over 50,000 Chinook salmon. During the fall run, UACG students monitor Adobe Creek and other waterways in the Petaluma Watershed system 24 hours a day, 7 days a week for returning fish. Fish that return to the Petaluma waterways are brought back to the UACG student hatchery for spawning. What is unclear, however, is whether or not the returning fish are original hatchery hatchlings. Amazingly, over twenty years worth of DNA samples from the returning fish has been cataloged and stored by the students. With these samples, we are launching a novel program, Molecular Analysis of DNA for Identifying Student Hatchery (MAD FISH). In collaboration with UC Davis and Sonoma State University, UACG high school members of MAD FISH will process historic and future DNA samples to determine if the returning fish really are the kids' original hatchery reared fish!

The need for a program like this is underscored by a directive recently issued by the Pacific Salmon Commission that hatchery supportive breeding programs begin to develop and implement programs that apply genetic methods to stock identification. Furthermore, coded-UACG Adobe Creek Project

wire tagging (CWT) is becoming indispensable in identifying migration and exploitation patterns, estimating and forecasting abundance, and in the regulation of fisheries. In addition to their restoration of riparian habitat and hatchery-based rehabilitation of indigenous fish, the students of UACG are implementing CWT programs that will for the first time allow *high school students* to report scientific data to the Pacific Salmon Commission, the Salmon Regional Mark Processing Center, CalFish and the California DFG!

Use of Funds

Funds must be secured to begin brick and mortar construction of laboratory space to the already existing student conservation hatchery. Support will also allow the students to power their facility through the application of solar energy, congruent with their environmental directives. In addition, full funding will make it possible to establish an educational outreach center in the classroom. With a multi-media center, internet broadcasts of the following activities can be disseminated around the world to teach and inspire those beyond our community. Full funding would allow EACH of the following activities to be broadcast and shared globally:

- *Creek restoration and rehabilitation:* Students operate and manage all aspects of the restoration fish hatchery project, from daily creek walks involving litter removal and tree planting to spawning, rearing and releasing their fish. This also involves scrubbing raceways and performing general hatchery maintenance and repair. Finally, the students are responsible for giving public presentations about their project and leading public tours of the hatchery.
- *MAD FISH program:* Through mentorship from salmonid geneticists, the students will be engaged in all aspects of hands-on DNA analysis. A classroom portion of this project held in the student's own fish hatchery classroom will include guest lectures and training in DNA technologies provided by post-doctoral staff at UC Davis and Sonoma State University.
- *CWT program:* Students will work with the Dept. of Fish and Game to mark/CWT all hatchery reared fish before release. We anticipate this program will yield long-term hatchery-reared recovery data, obviating the need for the students to prepare annual reports, the construction of databases and spreadsheets in collaboration with the Salmon Regional Mark Processing Center, and descriptions of monitoring efforts.
- *Outreach to the Junior Angler Program:* High school members of UACG will continue to organize the Junior Angler program and serve as mentors to local third and fifth graders in their classrooms. This also includes giving the elementary school children a key role in releasing the hatchery-reared fish in the spring.

Community Benefits from Full Funding

As DNA fingerprints emerge encompassing the past twenty years of the student's hatchery-based supportive breeding program, and hatchery release objectives are analyzed through CWT, science-based conservation strategies and policy can be evaluated and developed for the future of our local fisheries. In addition, the application of alternative solar energy to the existing classroom and hatchery will help the students rise to the challenge of creating greener buildings in their neighborhood. The most exciting benefit, however, comes from the educational outreach we propose. Community stewardship, coupled with scientific method and old-fashioned hard work, will be broadcast and shared with other students across the U.S. as a template for change. By broadcasting the inspirational work of these students, we hope to empower our youth and work toward creating the next generation of scientific and environmental leaders!